

143/6 Abstand  $A(3|a|0)$  zu  $E \stackrel{!}{=} 5$

$$a) \begin{pmatrix} 0 \\ 3 \\ 4 \end{pmatrix} \cdot \left[ \vec{x} - \begin{pmatrix} 9 \\ 2 \\ 4 \end{pmatrix} \right] = 0$$

$$3x_2 + 4x_3 - 22 = 0 \quad |\vec{n}| = \sqrt{3^2 + 4^2} = 5$$

$$HNF: \frac{1}{5} (3x_2 + 4x_3 - 22) = 0$$

$$d(A, E) = \left| \frac{1}{5} (3a - 22) \right| = 5$$

$$\swarrow \quad \searrow$$
$$\frac{1}{5} (3a - 22) = 5$$

$$3a - 22 = 25$$

$$\underline{\underline{a = 15 \frac{2}{3}}}$$

$$\frac{1}{5} (3a - 22) = -5$$

$$3a - 22 = -25$$

$$\underline{\underline{a = -1}}$$

Zur Erinnerung

$$|-5| = 5$$

$$|5| = 5$$

Daher Fallunter-  
scheidung

$$b) E: 12x_1 - 5x_2 - 10 = 0 \quad |\vec{n}| = \sqrt{12^2 + 5^2} = 13$$

$$E_{HNF}: \frac{1}{13} (12x_1 - 5x_2 - 10) = 0$$

$$d(A, E) = \left| \frac{1}{13} (12 \cdot 3 - 5a - 10) \right| = \left| \frac{1}{13} (26 - 5a) \right|$$

$$= \left| 2 - \frac{5}{13}a \right| \stackrel{!}{=} 5$$

$$\swarrow \quad \searrow$$
$$2 - \frac{5}{13}a = 5$$

$$\underline{\underline{a = -7,8}}$$

$$2 - \frac{5}{13}a = -5$$

$$\underline{\underline{a = 18,2}}$$